



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,447	04/12/2006	Christian Muller	NITROF P65AUS	2084
20210 7590 02/10/2009 DAVIS & BUJOLD, P.L.L.C. 112 PLEASANT STREET CONCORD, NH 03301				
EXAMINER				
DOERFLER, WILLIAM CHARLES				
ART UNIT		PAPER NUMBER		
3744				
MAIL DATE		DELIVERY MODE		
02/10/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/575,447

**Applicant(s)**

MULLER ET AL.

**Examiner**

William C. Doerrler

**Art Unit**

3744

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 26-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 48 is/are allowed.
- 6) ☒ Claim(s) 26-40, 43-47 and 49 is/are rejected.
- 7) ☒ Claim(s) 41 and 42 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB08)
- Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_



**DETAILED ACTION**

***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 26-47 and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In line 15 of claim 26 and line 16 of claim 49, "the" should be --each--as there are previously 2 fluid circuits claimed. Claims 27-47 depend on claim 26, so they are unclear due to their dependency.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 26-34 and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGregoria et al (5,249,424) in view of Chilowsky (2,510,800).

DeGregoria shows a device for generating thermal flux having magneto-caloric elements 31,32,35 and 36 and magnets 33 and 37. The magnets are moved reciprocally in a translation motion (see figures 3-6) to produce entropy changes in the magneto-caloric material. The heat is transferred through a fluid being pumped through the magneto-caloric material to a heating heat exchanger 46 and a cooling heat exchanger 57. DeGregoria et al discloses applicants' basic inventive concept, a magnetic cooling system that moves magnets reciprocally in relation to magneto-caloric material to produce cooling, substantially as claimed with the exception of using a hot and cold circuit with synchronization means to control the flow of heat transfer fluid through the magneto-caloric material to provide controlled heating and cooling.

Chilowsky discusses separate heating and cooling circuits for a magnetic refrigerator between lines 64 of column 4 and line 25 of column 5, with line 24 of column 5 stating that the flow through the respective circuits is alternated (the synchronization means). It would have been obvious to one of ordinary skill in the art at the time of applicant's invention from the teaching of Chilowski to modify the magnetic cooling system of DeGregoria et al by using synchronized flow of heat transfer fluid through separate hot

and cold circuits to ensure proper flow of heat transfer through the magneto-caloric material. In regard to claim 28, figures 3 and 4 of Degregoria et al show the heat transfer fluid traveling in different directions in different portions of the cycle. In regard to claim 29, it is noted that the GdNi used as magneto-caloric material in DeGregoria et al comprising Gd. In regard to claim 31, the heat transfer fluid passes through channels 142 through the magneto-caloric material of DeGregoria et al.

In regard to claim 30, neither reference states what material is used to contain the magneto-caloric material. However, copper, aluminum and steel are the most common materials for heat transfer devices, and as such would have been obvious to an ordinary practitioner in the art due to their availability, relative economy and heat transfer characteristics. In regard to claim 32, the number of through channels is seen as a matter of design choice for an ordinary practitioner in the art, balancing heat transfer with the production of a temperature change. In regard to claim 44, Chilowski shows circulators 14 and 25 for circulating the heat transfer fluid. In regard to claim 45, Chilowski shows heating heat exchanger 7 and cooling heat exchanger 21.

Claims 35-40 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over DeGregoria et al in view of Chilowski as applied to claims 26-34 and 49 above, and further in view of Zimm et al (6,685,560).

DeGregoria, as modified, discloses applicants' basic inventive concept, a magnetic refrigeration system with a reciprocating magnet moved over thermal units which have a heating and cooling fluid alternating supplied through them, substantially as claimed with the exception of using a C shaped magnet and ring-shaped magnet and thermal

bodies. Zimm et al show these features to be old in the art with separators 14 separating thermal ring into units (see line 38 of column 3) with C shaped magnet being passed through when the ring pivots on axis 48. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention from the teaching of Zimm et al to modify the magnetic refrigerator of DeGregoria by using a circular ring and C-shaped magnet to provide a system with easily controlled motion and a concentrated magnetic field. In regard to claim 35 and 37, figure 5 of Zimm et al shows thermal elements 50 passing in the opening of a pair of C-shaped magnets 40. In regard to claim 40, the arrangement of disclosed parts (in either parallel or perpendicular configuration relative to the axis) is considered a matter of ordinary design choice for an ordinary practitioner in the art which will not change the functioning of the refrigeration aspect, as long as the relative motion is preserved.

#### ***Allowable Subject Matter***

Claims 41 and 42 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 48 is allowed.

#### ***Response to Arguments***

Applicant's arguments with respect to claims 26-49 have been considered but are moot in view of the new ground(s) of rejection.

Chilowski shows a hot and cold circuit with valves controlling the flow of the heat transfer fluid through respective circuits being alternated. Valves 16 and 30 are seen as

a synchronization means to coordinate the movement of the fluid through the respective passages.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Barclay '927 shows a magnetic refrigerator with separate flow circuits for the heating fluid and cooling fluid.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Doerrler whose telephone number is (571) 272-4807. The examiner can normally be reached on Monday-Friday 6:30-4:30.



If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

William C Doerler  
Primary Examiner  
Art Unit 3744

WCD

/William C Doerler/  
Primary Examiner, Art Unit 3744